CLAIMS

1. A method of polishing and/or brightening a magnesium or magnesium alloy surface comprising the steps of:

i) polishing the surface, and

ii) passivating the polished surface,

wherein the polishing step is carried out by a chemical polish and/or electro-chemical polish while said surface is immersed in a polishing composition of one or more of the following components: a phosphoric acid solution, monopropylene glycol, ethylene glycol, and nitric acid.

2. A method of polishing and/or brightening a magnesium or magnesium alloy surface as claimed in claim 1, wherein the method further comprises an initial step of pre-treating said surface to remove surface contaminants.

3. A method of polishing and/or brightening a magnesium or magnesium alloy surface as claimed in claim 2, wherein said pre-treating step comprises chemically etching said surface and/or degreasing said surface.

4. A method of polishing and/or brightening a magnesium or magnesium alloy surface as claimed in claim 2 or claim 3, wherein surface contaminants are removed during the pre-treatment step by contacting said surface with one or more degreasing components, such as sodium hydroxide.

5. A method of polishing and/or brightening a magnesium or magnesium alloy surface as claimed in claim 3, wherein said chemical etching component is nitric acid solution and/or phosphoric acid.

6. A method of polishing and/or brightening a magnesium or magnesium alloy surface as claimed in any one of the preceding claims, wherein said chemical polish and/or electro-chemical polish removes surface layers and/or reduces microscopic high points from the surface.

7. A method of polishing and/or brightening a magnesium or magnesium alloy surface as claimed in any one of the preceding claims, wherein said electro-chemical polish is a galvanic electrolysis.

8. A method of polishing and/or brightening a magnesium or magnesium alloy surface as claimed in any one of the preceding claims, wherein said electrochemical process further includes the supply of an external voltage to said surface.

9. A method of polishing and/or brightening a magnesium or magnesium alloy surface as claimed in any one of the preceding claims, wherein during said electro-chemical polish an electrolyte anti-stagnation means is utilised or an AC voltage is applied to the electrolyte containing said surface.

10. A method of polishing and/or brightening a magnesium or magnesium alloy surface as claimed in claim 9, wherein said electrolyte anti-stagnation means is an electrolyte stirrer and/or an ultrasonic wave generating means.

11. A method of polishing and/or brightening a magnesium or magnesium alloy surface as claimed in any one of the preceding claims, wherein said polishing step is followed by an intermediary wash removing at least some of the chemical and/or electrolyte solution from said surface.

12. A method of polishing and/or brightening a magnesium or magnesium alloy surface as claimed in claim 11, wherein said intermediary wash is carried out in a composition containing monopropylene glycol and/or ethylene glycol.

13. A method of polishing and/or brightening a magnesium or magnesium alloy surface as claimed in any one of the preceding claims, wherein said polishing step is followed by an alkaline wash.

14. A method of polishing and/or brightening a magnesium or magnesium alloy surface as claimed in claim 11 or claim 12, wherein said intermediary wash is followed by an alkaline wash.

15. A method of polishing and/or brightening a magnesium or magnesium alloy surface as claimed in claim 13 or claim 14, wherein said alkaline wash substantially neutralises acids and/or substantially removes Aluminium, Manganese or Zinc from said surface.

16. A method of polishing and/or brightening a magnesium or magnesium alloy surface as claimed in claim 13 or claim 14, wherein said alkaline wash is carried out in a composition containing sodium hydroxide.

17. A method of polishing and/or brightening a magnesium or magnesium alloy surface as claimed in any one of the preceding claims, wherein said passivating step provides a substantially corrosion resistant and/or water insoluble surface coating or film.

18. A method of polishing and/or brightening a magnesium or magnesium alloy surface as claimed in claim 17, wherein said substantially corrosion resistant and/or water insoluble surface coating or film is a phosphate salt coating or film.

19. A method of polishing and/or brightening a magnesium or magnesium alloy surface as claimed in claim 17 or claim 18, wherein said passivating step voltage is varied to alter said substantially corrosion resistant and/or water insoluble surface coating or film thickness.

20. A method of polishing and/or brightening a magnesium or magnesium alloy surface as claimed in claimed in any one of the preceding claims, wherein an inorganic material coating or sealer is applied to said substantially corrosion resistant and/or water insoluble surface coating or film.

21. A method of polishing and/or brightening a magnesium or magnesium alloy surface as claimed in claim 18, wherein said inorganic material coating or sealer is substantially transparent and/or substantially provides corrosion protection and/or at least provides some protection from mechanically induced damage.

22. A method of polishing and/or brightening a magnesium or magnesium alloy surface as claimed in claim 20 or claim 21, wherein said inorganic material coating or sealer is a silicon based composition, such as a disodium metasilicate, and a polyacrylamide coagulant in de-ionised water.

23. A method of polishing and/or brightening a magnesium or magnesium alloy surface as claimed in any one of the preceding claims, wherein said passivating step and/or said inorganic material coating or sealer step is followed by a surface drying step.

24. A method of polishing and/or brightening a magnesium or magnesium alloy surface as claimed in any one of the preceding claims including the pre-treatment steps of:

a. immersing the surface in an iron based solution,

b. activating said surface with said iron based solution, wherein said iron based solution is reduced to thereby deposit iron on said surface,

c. etching said surface with an etch composition to modify the activated surface layer,

d. stripping iron deposits from said surface with an iron removal composition, and

e. washing said surface to substantially remove compositions remaining on said surface.

25. A method of polishing and/or brightening a magnesium or magnesium alloy surface as claimed in claim 24, wherein said activator is a solution selected from the following; ferric chloride, hydrochloric acid, ammonium bifluoride, and ammonium bromide.

26. A method of polishing and/or brightening a magnesium or magnesium alloy surface as claimed in claim 24 or claim 25, wherein said etch composition is selected from the following; ferric chloride; ferric chloride and phosphoric acid solution, or a reduced solution of ferric chloride and phosphoric acid.

27. A method of polishing and/or brightening a magnesium or magnesium alloy surface as claimed in claim any one of claims 24 to 26, wherein said iron removal composition is selected from the following; nitric acid and sodium borate in solution, or nitric acid and phosphoric acid in solution.

28. A method of polishing and/or brightening a magnesium or magnesium alloy surface as claimed in any one of claims 24 to 27, wherein said step of washing said surface is carried out with a water wash or an alkaline wash.

29. A method of polishing and/or brightening a magnesium or magnesium alloy surface substantially as hereinbefore described and with reference to any one of the accompanying drawings.

30. A magnesium or magnesium alloy surface polished or brightened according to the method substantially as hereinbefore described and with reference to any one of the accompanying drawings.